

Notes from the Edge

Insights into an Evolving Future



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CHARACTER OF CONFLICT

What Crimea Tells Us About Asia's Future Wars. While flashpoints such as the Taiwan Strait, East China Sea, Korean Peninsula and the South China Sea skew our perspectives of a future conflict to one involving a two-sided confrontation between national militaries, the author opines that Crimea and the complex military occupation now in Ukraine offer an all too probable model for future conflict in Asia.

Asia's Future Wars

War in Space May be Closer Than Ever. The emptiness of outer space might be the last place you'd expect militaries to vie over contested territory, except that outer space isn't so empty anymore. About 1,300 active satellites wreath the globe in a crowded nest of orbits, providing worldwide communications, GPS navigation, weather forecasting and planetary surveillance. For militaries that rely on some of those satellites for modern warfare, space is the ultimate high ground. As China and Russia aggressively seek to challenge U.S. superiority in space with ambitious military space programs of their own, the power struggle risks sparking a conflict that could cripple the entire planet's space-based infrastructure and ignite full-blown war on Earth.

War in Space

War Between Russia and the West Could Spark 'Dystopian Future Where London Ceases to Exist'. Britain could be plunged into a bleak dystopian future where London ceases to exist if all-out war erupts between Russia and the West, according to a leading futurologist. Relations between Moscow and Western countries have been particularly frayed due to the crisis and continued violence in Ukraine. Dr. Ian Pearson warned of the peril that could ensue in the next century should tensions boil over.

Dystopian War

DEMOGRAPHICS

5 Ways the World Will Look Dramatically Different in 2100. According to UN estimates, the world will have 11.2 billion people by 2100, up from the current global population of 7.3 billion. This projected figure could be revised downwards should the pace of birth rates decline in communities where women now tend to have more children and if access to birth control expands. The region expected to have the biggest population growth is Africa, due to its young population and high fertility rates. Currently, Africa only constitutes 16% of the world's population but this is estimated to rise to 49% by 2100.

Slowing Population Explosion

Will the World Reach 10 Billion People? While the drivers of future population growth are well known (economic development, urbanization, health and education), there is still a major debate about the rate of population growth and the possibility that we may reach a global peak of 10 billion people in this century. The authors argue that if the power of education is included in demographic modelling on top of the general decline in fertility across all groups in society, we might not indeed reach 10 billion.

Population Expansion

ECONOMICS

Why is China Investing in Africa? China's increased trade with and investment in Africa has boosted the continent's growth rate, but has also generated considerable controversy. In "Why is China investing in Africa? Evidence from the firm level," David Dollar, Heiwai Tang, and Wenjie Chen provide a nuanced view of China's outward direct investment (ODI) in Africa by investigating China's macro and micro ODI data in Africa.

Investing in Africa

Cryptocurrency Represents the Beginning of a New Phase of Technology-Driven Markets.

PricewaterhouseCoopers (PwC) recently published a paper titled "Money is No Object: Understanding the Evolving Cryptocurrency Market to Examine and Explain its Position on Cryptocurrencies". PwC opines cryptocurrencies carry groundbreaking potential to allow any consumer in any part of the world access to a global payment system in which participation is restricted only by access to technology, rather than by factors such as having a credit history or a bank account.

Global Payment

The Looming Problem That Could Kill Bitcoin. According to Gavin Andresen, former chief caretaker of the code that powers Bitcoin, the digital currency will start to malfunction early next year. Transactions will become increasingly delayed, and the system of money now worth \$3.3 billion will begin to die as its flakiness drives people away. Andresen's gloomy prediction stems from the fact that Bitcoin can't process more than seven transactions a second. That's a tiny volume compared to the tens of thousands per second that payment systems like Visa can handle—and a limit he expects to start crippling Bitcoin early in 2016.

Problems for Bitcoin

ENVIRONMENTAL STRESS

Industries that Will Be Hit by Arctic Change. Research suggests that the loss of Arctic summer sea ice will seriously impact ecosystems, societies, and economies globally. The authors opine that while some industries such as extraction and shipping can benefit from Arctic change, others such as agriculture, insurance, and tourism face steep economic risks. Although the Arctic remains too cold to grow crops, loss of summer sea ice affects crop yields elsewhere. The insurance and tourism industries will also be affected as a warmer Arctic may result in extreme weather events.

Arctic Change

How Much Will Antarctica and Greenland Ice Raise Seas? Scientists are using computer models to simulate ice shelves and climate change in the next century. According to a study published in *The Cryosphere*, sea levels will rise by 7.9 inches by 2100, posing a risk to low-lying nations.

[Raising Seas](#)

TECHNOLOGY

Welcome to the World, Drone-Killing Laser Cannon. Boeing has developed a laser cannon specifically designed to turn unmanned aircraft into flaming wreckage. WIRED reports that the company's new weapon system, known as the Compact Laser Weapons System, was recently publicly tested in New Mexico Industrial Park. Drones have increasingly become a security concern as people are flying them into areas they should not, such as above wildfires or onto the White House lawn. The laser cannon is compact, portable, precise and comparatively low-cost. Boeing hopes to have the weapon ready for market in a year or two, with many refinements and developments to come over the next few years.

[Drone Killer](#)

Engineers design invisibility cloak for military drones. Electrical engineers have created a new design for their cloaking device, using a Teflon substrate, studded with cylinders of ceramic, which is thinner than any prior development and does not alter the brightness of light around concealed objects. The Teflon has a low refractive index, while the ceramic's refractive index is higher, which allows light to be dispersed through the sheet without any absorption. Compared to an invisibility cloak, this technology has not only the ability to conceal, but the ability to increase optical communication signal speed and to collect solar energy.

[Drone Cloak](#)

'Lego-Stacking' Technique Could Help Scientists Grow Human Organs.

Scientists are using a new technique to create miniature, 3-dimensional models of human tissue. These models may enable scientist to grow complete human organs by using fragments of DNA to selectively latch one cell to the next. Organoids, laboratory-grown and partially functional miniature organs could be used to test personalized drugs.

[Growing Organs](#)

Lab-Grown Bones? They Could Make Painful Grafts History.

EpiBone, a New York City startup, is proposing an alternative to autografts: building bones from your own fat cells. A personalized shell and a fat sample (from which stem cells are extracted) would be placed inside of a bioreactor; a human bone would be produced in three weeks. EpiBone's work builds on the discovery from developmental biology that stem cells can transform into any part of the body.

[Growing Bones](#)

Night Vision Without the Goggles. Using a chemical called Chlorin e6, Gabriel Licina and Jeffrey Tibbetts have created night vision eye drops that make people's eyes more sensitive to red light, allowing them to see better in the dark. While not as good as military night vision goggles the test demonstrated the viability of temporary night vision enhancement.

[Night Vision Eye Drops](#)

MARINE CORPS SECURITY ENVIRONMENT FORECAST

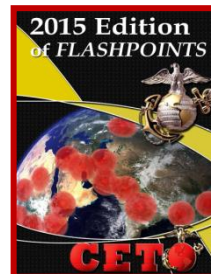
The 2015 **Marine Corps Security Environment Forecast: Futures 2030-2045** as announced in [MARADMIN 387/15](#) is open for public release and is available for download at the FAD website below:

Futures Assessment Division - MCSEF

FLASHPOINTS 2015

The 2015 edition of Flashpoints provides the results of our most recent analysis of factors associated with a nation's risk for conflict. It also provides an updated ranking for the 159 nations included in the study based on each nation's potential to experience future conflict or instability. This effort included extensive research, review, and analysis of several global patterns and trends related to the potential for instability and armed conflict. This work was conducted through a prism defined by rapidly occurring actions, events, and decisions with potentially significant regional and global implications, challenges, and opportunities. This is the tenth annual edition.

Futures Assessment Division - Flashpoints 2015



This newsletter is intended to highlight issues and ideas which may prove significant in the evolving future. In keeping with our focus on both alternative futures and analysis, items in this bulletin will generally be of an alternative nature, or drawn from atypical sources.